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THE FORMATION OF A NEW ISLAND IN THE MISSISSIPPI RIVER[1]

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While engaged in studying the vegetation of the bluffs in the vicinity of Columbus, Kentucky, in August, 1919, my attention was called to an island which had been forming in Number 5 Chute of the Mississippi River during the preceding six years. This chute separates Island Number 5, better known as Wolf Island, from the Missouri bank of the river just south of Belmont. The peculiar history of the island led me to visit it, and as the information regarding it was confirmed from authentic sources, the facts seem worth recording.

The island lies about a half mile west of the main channel of the river, and somewhat nearer to the Missouri side of the chute than to Wolf Island. It has grown very rapidly since deposition began, and is now nearly three fourths of a mile in length, and about an eighth of a mile in average width. The area, roughly estimated, is about 60 acres, and it stood then high enough to require a 43-foot stage of the river to inundate it.

The soil is a very light-colored sandy silt, such as is known along the river as a cottonwood soil. And the island is a veritable cottonwood thicket, with a most beautiful growth of young trees from 4 to 8 inches in diameter and 30 to 40 feet tall. The trees stand very close together and form very nearly a pure growth. The only other tree occurring is the willow, and there are probably not a hundred of them on the whole island. The trees give one the impression of uniformity in size and height that might arise from a single season's seeding.

It does not seem possible that an island of this size, and with such a fine growth of trees, could have formed in six years; but the history is well known locally, and there is no doubt as to its correctness. During March, 1913, there was a very unusual combination of storms and rainfall over much of the eastern half of the drainage basin of the Mississippi River. North of the Ohio River, from the western boundary of Indiana eastward to the Appalachians, the rainfall between March 22 and 28 was from six to eleven inches. This tremendous precipitation led to very destructive floods, as at Dayton, Ohio, and to a very high river stage throughout the Mississippi Valley south of Cairo.

The crest of the flood passed Cairo from April 4 to 8, during which time the river stood at 54.7 feet. It was during the recession of this great flood that a big barge was stranded on a rock bar in Number 5 Chute. This barge formed the original obstruction to the current which caused deposition. It lies completely buried in soil near the head of the island. (See Fig. 1.)

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[1] Contributions from the Botanical Laboratories of the Univ. of Kentucky No. 5.

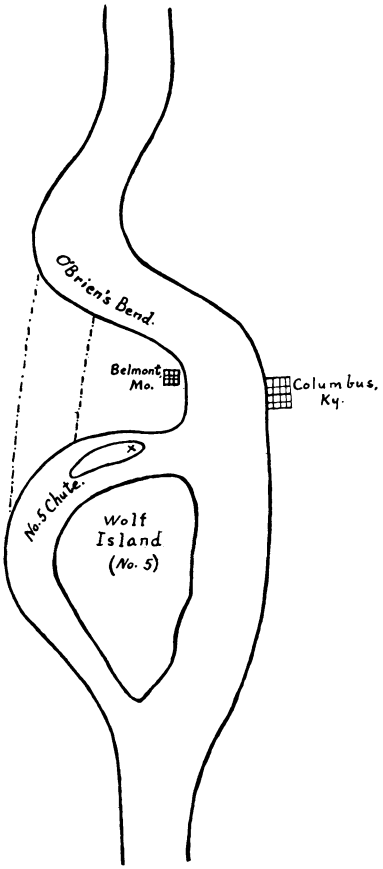

FIG. 1. Sketch map of No. 5 chute and vicinity. The point X represents the position of the stranded barge.

Every year since that time during flood stages of the river the island has increased rapidly in size. I am indebted to Mr. J. L. Kendall, observer of the Weather Bureau at Louisville, for the flood data presented. The crests of the floods at Cairo for each year since 1913 up to 1920 are shown in the table:

The crest of each flood usually reaches New Madrid, Missouri, about a day later than Cairo, and the stage is usually 8 to 10 feet lower at New Madrid. As Columbus lies about one third of the distance to New Madrid below Cairo, the crests would probably average a couple of feet lower than at Cairo. The island has been built by not more than a dozen periods of deposition. The floods still frequently cover the island, and each time it is inundated its area and height are materially increased. The last flood recorded was a very long one. The river reached a stage of 43.3 feet on March 18, and from that time until May 9 the island was constantly under water, except for several days, April 21–23, when the stage averaged 42.4 feet. This 1920 flood is the longest continuous period of deposition the island has experienced. From notes taken in June, 1920, by Mr. R. C. Summers, of Columbus, Kentucky, a month after this long flood subsided, the deposit during this period must have been 16 to 18 inches deep, or even more. All traces of under vegetation were destroyed, for, as Mr. Summers comments, "there is not a weed or a sprig of grass on the island." I am also indebted to Mr. Summers for the photographs.

Flood crests of the Mississippi, 1914–1920

1914.	April 10–11	41.3 feet
1915.	Feb. 11–13	45.6 "
1916.	Jan. 18–19	45.7 "
	Feb. 4	53.4 "
1917.	March 25–27	49.2 "
	April 4–5	50.1 "
	June 16–17	44.6 "
1918.	Feb. 25–26	39.8 "
1919.	March 24	48.5 "
	Dec. 20–21	42.1 "
1920.	March 31	51.4 "
	May 1–2	49.5 "

There is a reason for the very rapid deposition of silt in this channel during floods, and reference to the accompanying map (Fig. 1) will make the explanation clear. Just above Belmont, Missouri, the Mississippi sweeps eastward in a great bend known as O'Brien's Bend, and then turns southward past Columbus. At the time of the greatest floods the river cuts straight across behind Belmont and flows down the lower part of Number 5 Chute, west of Wolf Island. This channel is just about in line with the river above O'Brien's Bend. At a time when the river is high, therefore, the upper part of Number 5 Chute forms a cross-channel between two main channels of the river. It carries "dead water" which is unable to carry its load, and much of the sand and silt is dropped upon this new island. The tendency of the river indicates that it may straighten its channel at some future flood by cutting across behind Belmont, leaving the village on an island, and putting the main channel west of Wolf Island again, as it was formerly, instead of in front of Columbus.

In June, 1919, Mr. Martin Keirce took up his abode on the island and applied for a patent to the land from the government under the homestead laws of Missouri. He had cleared a few acres in the heart of the island a couple of months previous to my visit, had piled the cottonwood poles around the edge of his little farm, and wired them down in position to check the currents and aid deposition at each new flood. He kindly took me over the island and pointed out to me approximately the place where the barge is buried near the head of the deposit. After the flood of 1920 Mr. Summers found that the iron bed in Mr. Keirce's shack was buried in solid earth up to the springs, and the cook stove half buried in sediment. Figure 2 shows the clearing after the flood, with the tops of the corn stalks showing above the deposits.

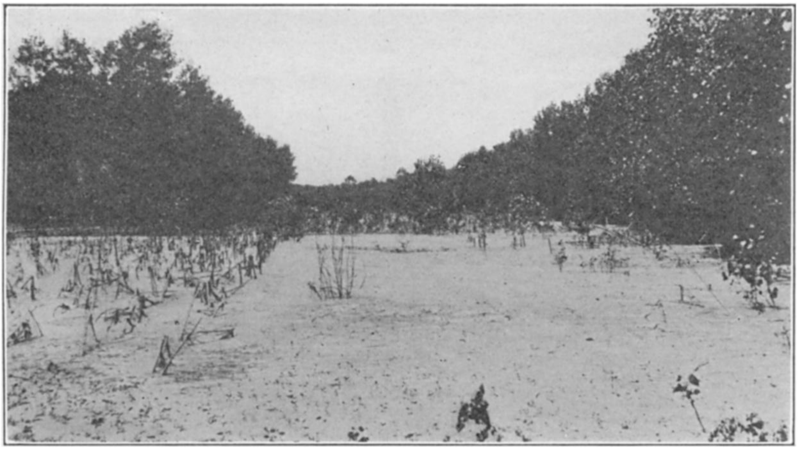

FIG. 2. Clearing, showing the silt deposit of 1920. Cottonwood forest in background and on right. (Photo by Summers.)

The channel on the north side of this new island is now beginning to fill, and a younger belt of cottonwoods is forming on that side. On the opposite side of the chute against the Missouri bank there is a mixture of cottonwoods and willows, the willows breast high, and the cottonwoods about three fourths as tall. It seems probable that before many years the island may be joined to the Missouri mainland.

The beautifully even height of the cottonwoods in local areas, not only on this island, but on many young flood-plain deposits and mud flats along the river, is very striking. Terrace-like vegetation, mostly willows and cottonwoods, sometimes several stratifications, are frequently to be observed. People who live along the river think that the trees have come at least in some cases from a single year's crop of seedlings.

The floods kill young trees if they are completely submerged for too long a time. But if the floods are not high for several years in succession, the seedlings of some one year will become tall enough to stand above even the highest waters. Being of the same age, equally crowded in thickets, they are usually rather uniform in size and height, producing very beautiful terraces.

It is probable that the history of most islands in the Mississippi is unknown. This new island is of interest because it gives one a concrete idea of the rapidity of deposition under favorable conditions, and its history is certainly unique.